

WHAT IS CLAIMED IS:

1. An exposure apparatus for irradiating a photosensitive substrate arranged on a wafer stage with exposure light through a projection optical system,
5 comprising:

a cover which extends from a wafer-side end of said projection optical system toward a vicinity of said wafer stage to surround an exposure optical path;

10 a first supply port through which purge gas formed of inert gas blows out inside said cover;

a first recovery port through which the purge gas supplied through said first supply port is drawn by suction; and

15 control means for blowing the purge gas through said first supply port and recovering the purge gas through said first recovery port to form a purge gas flow inside said cover, such that a flow rate of the purge gas recovered through said first recovery port is smaller than a flow rate of the purge gas supplied
20 through said first supply port.

2. The apparatus according to claim 1, further comprising:

a first pressure sensor which measures a pressure inside said cover; and

25 a second pressure sensor which measures a pressure outside said cover,

wherein the flow rate of the purge gas supplied

through said first supply port and/or the flow rate of the purge gas recovered through said first recovery port is controlled, on the basis of measurement results of said first and second pressure sensors, such that

5 the pressure inside said cover is higher than the pressure outside said cover.

3. An exposure apparatus for irradiating a photosensitive substrate arranged on a wafer stage with exposure light through a projection optical system,

10 comprising:

a cover which extends from a wafer-side end of the projection optical system toward a vicinity of the wafer stage to surround an exposure optical path;

purge means, having, inside said cover, a first supply port through which the purge gas formed of inert gas blows out and a first recovery port through which the purge gas supplied through the first supply port is drawn by suction, for forming a purge gas flow inside said cover; and

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20 blow-out means for blowing out gas through a blow-out port formed outside said cover toward a space in the vicinity of a wafer stage,

wherein the first supply port and blow-out port are arranged such that a flowing direction of the gas blowing out through the blow-out port and a direction of the purge gas flow oppose each other at an angle of not more than 90°.

4. The apparatus according to claim 3, wherein an angle formed by the flowing direction of the gas and the direction of the purge gas flow, which oppose each other, is not more than 45°.
5. The apparatus according to claim 3, wherein the flowing direction of the gas blowing out through the blow-out port and the direction of the purge gas flow are just opposite to each other.
6. The apparatus according to claim 3, wherein the gas blowing out through the blow-out port includes air or inert gas having a higher impurity concentration than that of the purge gas.
7. An exposure apparatus for irradiating a photosensitive substrate arranged on a wafer stage with exposure light through a projection optical system, comprising:
 - a cover which extends from a wafer-side end of the projection optical system toward a vicinity of the wafer stage to surround an exposure optical path;
 - 20 a first supply port through which purge gas formed of inert gas blows out toward an inside of said cover;
 - a second supply port which is formed in a lower portion of said cover and through which the purge gas 25 blows out toward the wafer stage; and
 - a first recovery port through which the purge gas supplied through said first and second supply ports is

drawn by suction.

8. The apparatus according to claim 7, wherein a flow rate of the purge gas recovered through said first recovery port is smaller than a total flow rate of the 5 purge gas supplied through said first and second supply ports.

9. The apparatus according to claim 7, wherein said second supply port is formed to surround a periphery of an exposure area.

10 10. The apparatus according to claim 7, wherein the second supply port is formed in a vicinity of said first supply port.

11. The apparatus according to claim 7, wherein said second supply port extends in a direction substantially 15 perpendicular to a scanning direction of exposure, and is formed on front and rear sides of an exposure area.

12. An exposure apparatus for irradiating a photosensitive substrate arranged on a wafer stage with exposure light through a projection optical system, 20 comprising:

a cover which extends from a wafer-side end of the projection optical system toward a vicinity of the wafer stage to surround an exposure optical path;

a first supply port through which purge gas 25 formed of inert gas blows out toward an inside of said cover;

a first recovery port through which the purge gas

supplied through said first supply port is drawn by suction; and

a second recovery port which is formed at least in a lower portion of said cover and through which the
5 purge gas is to be recovered in a direction from the stage.

13. The apparatus according to claim 12, wherein a total flow rate of the purge gas recovered through said first and second recovery ports is smaller than a total
10 flow rate of the purge gas supplied through said first supply port.

14. The apparatus according to claim 12, wherein said second recovery port is arranged in a vicinity of said first supply means.

15 15. The apparatus according to claim 12, wherein said second recovery port extends in a direction substantially perpendicular to a scanning direction of exposure, and is formed on front and rear sides of an exposure area.

20 16. The apparatus according to claim 1, further comprising a straightening member disposed at least in part of said first supply port.

17. The apparatus according to claim 16, wherein at least part of a surface that forms said straightening
25 member forms a curved surface or streamline.

18. The apparatus according to claim 1, wherein said first supply port and first recovery port are arranged

inside said cover such that the purge gas flows parallel to a scanning direction of exposure.

19. The apparatus according to claim 3, further comprising:

5 a first pressure sensor which measures a pressure inside said cover;

a second pressure sensor which measures a pressure outside said cover; and

control means for controlling a flow rate of the
10 purge gas supplied through the first supply port,
and/or a flow rate of the purge gas recovered through
the first recovery port, and/or a flow rate of the
purge gas supplied through the second supply port,
and/or a flow rate of the purge gas recovered through
15 the second recovery port, on the basis of measurement
results of said first and second pressure sensors, such
that the pressure inside said cover is higher than the
pressure outside said cover.

20. A device manufacturing method including a step of
20 forming a pattern on a substrate by using the exposure
apparatus according to claim 1.